



PLUMBING

Plumbing 1

A program with a sequence of courses that prepares individuals to apply technical knowledge and skill to lay out, assemble, install, and maintain piping, fixtures, and piping systems for stream, hot water, heating, cooling, draining, lubricating, sprinkling, and industrial processing systems. Includes instruction in material selection and use of tools to cut, bend, join, and weld pipes. These courses are based on the current National Center for Construction Education and Research (NCCER) task list.

USOE
7/21/2008

PLUMBING 1

Levels: Grades 10-12
Units of Credit: Minimum 0.5
CIP Code: 460501
Prerequisite: None

CORE STANDARDS, OBJECTIVES AND INDICATORS

STANDARD **Students will receive an orientation to the plumbing trade.**
460501-01

OBJECTIVES

460501-0101 Describe the history of the plumbing trade.
460501-0102 Identify the stages of progress within the plumbing trade.
460501-0103 Identify the responsibilities of a person working in the construction industry.
460501-0104 State the personal characteristics of a professional.
460501-0105 Explain the importance of safety in the construction industry.

STANDARD **Students will be able to understand and demonstrate the use of plumbing tools.**
460501-02

OBJECTIVES

460501-0201 Identify the basic hand and power tools used in the plumbing trade.
460501-0202 Demonstrate the proper maintenance procedures to be used for hand and power tools.
460501-0203 Explain safety as it applies to plumbing tools.

STANDARD **Students will be able to understand and demonstrate the use of plumbing math.**
460501-03

OBJECTIVES

460501-0301 Identify the parts of a fitting and use common pipe measuring techniques.
460501-0302 Use fitting dimension tables and a framing square to determine fitting allowances and pipe makeup.
460501-0303 Calculate end-to-end measurements by figuring fitting allowances and pipe makeup.
460501-0304 Use a framing square to find the center of fittings.
460501-0305 Figure 45-degree offsets and travel using the Pythagorean theorem.
460501-0306 Figure 45-degree offsets and travel using the constant method.
460501-0307 Figure 45-degree offsets and travel using a framing square or tape measure.

STANDARD
460501-04 **Students will be able to understand and use plumbing drawings.**

OBJECTIVES

- 460501-0401 Identify pictorial (isometric and oblique), schematic, and orthographic drawings, and discuss how different views are used to depict information about objects.
- 460501-0402 Identify the basic symbols used in schematic drawings of pipe assemblies.
- 460501-0403 Explain the types of drawings that may be included in a set of plumbing drawings and the relationship between the different drawings.
- 460501-0404 Interpret plumbing-related information from a set of plumbing drawings.
- 460501-0405 Convert plan view drawings to simple isometric drawings.
- 460501-0406 Use an architect's scale to draw lines to scale and to measure lines drawn to scale.
- 460501-0407 Discuss how local code requirements apply to certain drawings.

STANDARD
460501-05 **Students will be able to understand and demonstrate the use of plastic pipe and fittings.**

OBJECTIVES

- 460501-0501 Identify the common types of materials and schedules of plastic piping.
- 460501-0502 Identify the common types of fittings and valves used with plastic piping.
- 460501-0503 Identify and determine the kinds of hangers and supports needed for plastic piping.
- 460501-0504 Identify the various techniques used in hanging and supporting plastic piping.
- 460501-0505 Demonstrate the ability to properly measure, cut, and join plastic piping.
- 460501-0506 Follow basic safety precautions for the installation, operation, and maintenance of plastic tubing.
- 460501-0507 Identify the hazards and safety precautions associated with plastic piping.

STANDARD
460501-06 **Students will be able to understand and demonstrate the use of copper pipe and fittings.**

OBJECTIVES

- 460501-0601 Select the correct types of materials for copper piping systems.
- 460501-0602 Identify types of fittings and valves and their uses.
- 460501-0603 Select the correct hanger or support for the application.

- 460501-0604 Select the appropriate personal protective equipment for working with copper piping.
- 460501-0605 Correctly measure, cut, ream, and join copper piping.

STANDARD
460501-07 **Students will be able to understand and demonstrate the use of fixtures and faucets.**

OBJECTIVES

- 460501-0701 Identify the basic types of materials used in the manufacture of plumbing fixtures.
- 460501-0702 Discuss common types of sinks, lavatories, and faucets.
- 460501-0703 Discuss common types of bathtubs, bath-shower modules, shower stalls, and shower baths.
- 460501-0704 Discuss common types of toilets, urinals, and bidets.
- 460501-0705 Discuss common types of drinking fountains and water coolers.
- 460501-0706 Discuss common types of garbage disposals and domestic dishwashers.

STANDARD
460501-08 **Students will be able to understand drain, waste and vent (DWV) Systems.**

OBJECTIVES

- 460501-0801 Explain how waste moves from a fixture through the drain system to the environment.
- 460501-0802 Identify the major components of a drainage system and describe their functions.
- 460501-0803 Identify types and parts of traps and explain the importance of traps, and how traps lose their seals.
- 460501-0804 Identify the various types of DWV fittings and describe their application.

STANDARD
4605001-09 **Students will be able to understand water, distribution systems.**

OBJECTIVES

- 460501-0901 Discuss how water moves from the source, through the water distribution system, and to the fixture.
- 460501-0902 Identify the major components of water distribution system and describe the function of each component.
- 460501-0903 Explain the relationships between the components of a water distribution system.

PROFESSIONAL DEVELOPMENT

STANDARD
460501-10 **Students will understand the need for professional development.**

OBJECTIVES

460501-1001	Complete a personal inventory
460501-1002	Set and meet goals
460501-1003	Motivate yourself
460501-1004	Decision making
460501-1005	Manage time
460501-1006	Organize personal belongings and lab equipment
460501-1007	Communicate verbally
460501-1008	Write effective communications
460501-1009	Establish a personal reading program
460501-1010	Develop effective work skills and attitudes
460501-1011*	Master a working knowledge of SkillsUSA <ul style="list-style-type: none">▪ state the SkillsUSA motto▪ state the SkillsUSA creed▪ learn the SkillsUSA colors▪ describe the official SkillsUSA dress▪ describe the procedure for becoming a SkillsUSA officer

**STANDARD
460501-11****Students will understand the need for leadership skills.****OBJECTIVES**

460501-1101	Serve on a committee
460501-1102	Prepare an agenda
460501-1103	Assist in planning a meeting
460501-1104	Review basic parliamentary procedure <ul style="list-style-type: none">▪ Make a main motion
460501-1105	Participate in a school project
460501-1106	Attend a community meeting
460501-1107	Practice effective speaking
460501-1108	Present a 3-5 minute talk
460501-1109	Implement a leadership project
460501-1110*	Master a working knowledge of SkillsUSA <ul style="list-style-type: none">▪ Describe the meaning of the SkillsUSA emblem▪ State the SkillsUSA pledge▪ Describe the duties of a SkillsUSA officer

**STANDARD
460501-12****Students will understand the need for career planning.****OBJECTIVES**

460501-1201	Define your future occupation
460501-1202	Survey employment opportunities
460501-1203	Report on a trade journal article
460501-1204	Explore opportunities for advanced training

460501-1205	Conduct a worker interview
460501-1206	Contact a professional association
460501-1207	Explore entrepreneurship opportunities
460501-1208	Give a talk about your career
460501-1209	Review career goals

STANDARD **Students will understand the need for employment skills.**
460501-13

OBJECTIVES

460501-1301	Develop a list of work standards to follow at school and on the job.
460501-1302	Evaluate your personal ethics <ul style="list-style-type: none"> ▪ Evaluate your personal ethics against acceptable workplace ethics
460501-1303	Build a job search network
460501-1304	Find job leads
460501-1305	Write a resume
460501-1306	Create a job portfolio
460501-1307	Complete a job application
460501-1308	Write a business letter and memo
460501-1309	Participate in an actual or simulated job interview

*SkillsUSA PDP requirements - recommended